

[M. Roland-Gosselin's bold explanation of the occurrence of these *Rhipsalis* species of Cactaceae in tropical Asia and Africa, the family being otherwise American in distribution, is an important contribution.—N. L. B.]

## A CASE OF ABNORMAL DEVELOPMENT OF A SHORT GROWTH IN *PINUS EXCELSA*

BY ARTHUR H. GRAVES

The characteristic development in the genus *Pinus* of two sorts of shoot axes—long and short—is well known to all who are acquainted with the genus. The long growth (*Langtrieb*) is represented by the main axis or axes of the shoot system; the short growths (*Kurztriebe*) consist of much abbreviated branches which are borne on the long growth, arranged spirally upon it, and subtended by its scale-like leaves. These short growths or branches are characterized primarily by the fascicles of leaves they bear; each one, in the group of the white pines, developing normally five leaves, in a whorl-like cluster or "fascicle." Microscopical examination shows near the base of these leaves, and surrounded by them, a tiny growing point at the terminus of the short growth. Under ordinary conditions this growing point never develops further; and at the end of two or two and one half years the whole short growth is shed, in essentially the same manner as a leaf is cast from one of our deciduous trees.

Under special conditions, however, as for example when the growing point of the long growth is injured, a development of a short growth into a long growth rarely occurs.\* An interesting case of this kind was recently found by the writer on a tree about 15 years old of *Pinus excelsa* Wall. in the New York Botanical Garden, and is illustrated in figure 1. The five leaves composing the original fascicle may be seen at the base of the shoot, one of them having been slightly twisted in order to show

\* Engler, A., und K. Prantl. Die natürlichen Pflanzenfamilien nebst ihren Gattungen und wichtigeren Arten insbesondere den Nutzpflanzen. 2<sup>1</sup>: 29 note. Leipzig. 1889.



FIG. 1. Photograph, showing abnormal development of short growth into long growth in *Pinus excelsa* Wall. About  $\frac{3}{4}$  nat. size.

the latter to better advantage. It is quite evident that the shoot has developed from the growing point of the short growth, which, as above stated, normally atrophies and dies. The cause of this abnormal development is probably to be looked for in the dying out, due to injury of some sort, of the growing point of the long growth. All that remains of this may be seen in the figure as a small prominence to the left of the base of the original leaf fascicle.

It was asserted above that this phenomenon is a rare occurrence, a statement which should perhaps be qualified by adding that it is rare in trees older than the seedling stage. For the writer has seen not only buds develop at the terminus of the short

growths in especially vigorous two or three year old white pine (*Pinus Strobus* L.) seedlings, in the nursery of the Yale Forest School; but also fully formed shoots, which, judging from the five leaves at their base, have clearly developed from such short growth buds.

Professor J. W. Toumey, of the Yale Forest School, states that he has seen, in the vicinity of New Haven, a large tree of *Pinus Strobus* L., which, as a result of some kind of injury, had developed a considerable number of its short growths into long growths.

*Pinus excelsa* Wall., from which the shoot illustrated was taken, is also a member of the white pine group. It is commonly known as the Bhotan pine, and is a native of the Himalayas. As far as the writer can ascertain, the abnormality under discussion has not been before recorded for this species. According to Penzig,\* however, the phenomenon has been noted in *Pinus sylvestris* L. by several observers.

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## THE DISTRIBUTION OF MACROCYSTIS PYRIFERA ALONG THE AMERICAN SHORE OF THE STRAIT OF JUAN DE FUCA

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Setchell and Gardner† report *Macrocystis pyrifera* as extending northward "up to the Strait of Juan de Fuca" and state that "It does not seem to be plentiful in Puget Sound itself." They report a specimen collected by Gardner from the west coast of Whidby Island. Dr. Gardner states in a letter to the writer, that this was a floating specimen and that he did not find this species growing on the coast of Whidby Island.

Saunders,‡ in speaking of the distribution of this kelp in

\* Penzig, O. Pflanzen-Teratologie 2: 497. Genoa. 1894.

† Setchell, W. A., and Gardner, N. L. Algae of Northwest America, University of California Press. Berkeley, 1903.

‡ Saunders, De Alton. Harriman Alaska Series of the Smithsonian Institution, Vol. V.